ANNUAL REPORT

Wisconsin Dept. of Natural Resources

Bureau of Endangered Resources

Inventory & Monitoring Section

Adult goshawk near Rhinelander, WI.
(Photo Credit: Michele Woodford)

PROJECT: FOREST MANAGEMENT GUIDELINES AND TERRITORY MONITORING FOR NORTHERN GOSHAWKS - 2012

PERIOD COVERED: July 2011– June 2012

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PROJECT SUMMARY

Northern goshawks (*Accipiter gentilis*) are a species of greatest conservation need (SGCN) in Wisconsin. This field season was the 11th of the past 12 years that territory monitoring occurred in northern Wisconsin. We also continued field evaluations of Wisconsin DNR's management guidelines for northern goshawk nesting areas. To date, when all three goshawk guidelines were followed, goshawk nesting areas were protected and retained when forest management activities occurred in or near the nesting area. We monitored 45 historic or reported goshawk nesting areas to provide data on goshawk reproduction and to compare nesting areas where management guidelines have been used to areas where guidelines were not followed. Goshawk productivity this year was below average levels recorded during the past 12 years.

PROJECT OBJECTIVES

1. Evaluate Management Guidelines for Goshawk Nesting Areas

DNR staff and partners have invested significant time and dollars to locate goshawk nesting areas, monitor historic territories, and assist land managers in application of management guidelines. In 2005, working management guidelines were developed for use on all state-managed properties. These guidelines were based on field data collected from known goshawk nesting areas, a complete literature review, field observations, and expert opinion. The guidelines have been widely used on many state-managed properties to protect critical goshawk nesting area habitat and were adopted department-wide in 2012.

Even though the guidelines are department-wide now, we continue to evaluate their effectiveness by monitoring resident pairs before, during, and after forest management activities, and by measuring changes to the forest structure and composition following harvest activities. This type of evaluation has not been completed anywhere in North America, so continued support for this objective is essential in understanding the efficacy of Wisconsin DNR's management guidelines. Evaluation and department-wide adoption of sound management guidance for goshawks provides the tools many public and private forest managers are seeking to conserve this important wildlife resource, retain forest biodiversity, enhance the habitat they occupy, as well as, actively manage forests.

2. Monitor Historic Goshawk Nesting Areas

Monitoring data collected during field visits to nesting areas is critical for managing forests to support goshawks in Wisconsin, as normally little or no other information is available for this rare and secretive forest raptor (but see Bruggeman et al. 2011). Besides providing annual monitoring of reproduction, these results provide a baseline that is used for comparison with results of objective 1 and are essential to evaluating the effectiveness of management guidelines.

RESULTS

Goshawk Management Guidelines

Wisconsin DNR's goshawk management recommendations have been fully or partially used at 25 known goshawk nesting areas (Table 1). Monitoring has also occurred at six other nesting areas where timber harvests were sold, but guidelines were either not available or not used. For each nesting area, we attempted to evaluate the impact of timber harvesting on the known breeding pair. Besides timber harvesting, other factors like predation, weather, or other unknown causes could disturb or fail a nest attempt, which makes assigning a positive or negative outcome difficult to determine. In those cases, the best available information was used and an uncertain outcome (i.e., yellow box) was assigned (Table 1).

When all three Wisconsin DNR management guidelines were followed for a goshawk nesting area, the territory remained occupied following timber sale activities (e.g., site numbers 15, 21, and 22; Table 1). When only the no-cut buffer and seasonal restrictions were used, but the forest canopy adjacent to the no-cut buffer is retained (i.e., single-tree selection and gap thinnings are prescribed), then it was likely that the territory remained occupied (site numbers 3, 7, and 17). When less protective measures were used like a smaller than recommended no-cut buffer or a clear-cut harvest around the no-cut buffer (site numbers 1, 2, 9, 11-14, 18, and 28), or no guidelines were used at all (site numbers 5, 6, and 8), then nesting area abandonment was 100%.

Ten additional nesting areas (site numbers 19, 20, 23-27, and 29-31; Table 1) have had management guidelines used during establishment of nearby timber sales. Monitoring these sites over the next few years will improve our ability to fully evaluate the goshawk management guidelines.

Table 1. Summary and known outcomes for goshawk nesting areas where timber harvest activities were planned or occurred, management guidelines used, and monitoring completed.

Site #	ID	County	Ownership	Yr Nest Reported	Yr. Guides Used[1]	Guide 1 - (No-cut Area)	Guide 2 - (Residual BA)	Guide 3 - (Seasonal Disturbances)	Year(s) of Harvest	Outcome[2]
1	78	Price	Flambeau Riv. SF	2000	2002	yes, (approx. 300 ft)	no	yes	2003-04	pair moved during sale, returned yr after completed for 1 yr then moved to 78a
2	102	Oneida	MFL	2003	2003	no	no	yes	2005	pair gone prior to sale completion
3	94	Oneida	Oneida Co. For.	2002	2002	yes	no	yes	2005-06	pair stayed; territory active 2006-12
4	109	Price	Price Co. For.	2003	Partial, 2003	yes	no, clear-cut around buffer	yes	2004-06	pair gone prior to sale start; likely caused by mammal predation and never returned
5	96	Price	Price Co. For.	2002	None	no	no	no	2002-03	pair gone following harvest
6	88	Shawano	MFL	2001	None	no	no	no	2002	pair gone following harvest
7	86	Forest	BCPL & CNNF	2001	Partial, 2002	?	no	yes	2003-04	pair stayed according to T. Erdman
8	76	Oneida	NHAL SF	2001	None	no	no	no	2003-05	pair stayed during sale, gone yr after
9	118	Oneida	MFL	2003	Partial, 2004	yes, (approx. 50 ft)	no	yes	2005-06	pair gone after harvest, only 50' buffer within clear-cut
10	84	Rusk	Flambeau Riv. SF	2000	None	no	no	no	2002-03	pair gone prior to harvest; showed up in 2006 in nearby sale area (84a)
11	119	Price	CNNF	2004	Used CNNF guides	yes	no	no	2007-08	pair gone in 2008 and 09
12	120	Vilas	NHAL SF	2004	2004	yes	no	yes	2005-06	pair gone; ~25 acre no-cut surrounded by clear-cut
13	78a	Price	Flambeau Riv. SF	2004	No; forest used own guidelines	?	no	?	2004-05	pair moved during harvest, then returned in following yr (2007); inactive since
14	104	Marinette	Wis. Public Service Corp.	2003	2003	yes, (~ 330 ft)	no	yes	2003	predation event in 2003 prior to harvest; territory inactive after harvest

Site #	ID	County	Ownership	Yr Nest Reported	Yr. Guides Used	Guide 1 - (No-cut Area)	Guide 2 - (Residual BA)	Guide 3 - (Seasonal Disturbances)	Year(s) of Harvest	Outcome
15	130	Vilas	NHAL SF	2006	2006	yes	yes	yes	2007	Active nest within guideline area- 2008 &09; inactive 2010-12
16	84a	Rusk	Flambeau Riv. SF	2007	2007	no	yes	yes	2008	territory inactive during harvest in 2008; new nest in adjacent unharvested area in 2009; territory occupied 2010-12
17	133	Vilas	Vilas Co. For.	2007	2007	yes	no	yes	2008	pair retained following small harvest; larger harvest (clear-cut) deferred in 2009
18	135	Vilas	Land O'Lakes TWN	2008	None	~200’	no	no	2009	200' buffer installed during harvest when reported; occupied nest 2009, territory abandoned 2010; yr after harvest
19	137	Bayfield	Bayfield Co. For.	2009	2009	yes	no	yes		to be determined; no activity 2012
20	134	Vilas	NHAL SF	2007	2008	no	yes	yes	2011-12	to be determined; occupied nest 2009
21	50	Vilas	NHAL SF	1994	2008	yes	yes	yes	2009-11	to be determined; occupied nest 2010-12
22	163	Iron	Iron Co. For.	2008	2008	yes	yes	yes	2009-10	territory occupied in 2010-12 after hardwood thinning
23	136	Florence	Florence Co. For.	2009	2010	none	yes	yes	2012-13	to be determined; occupied nest 2011-12
24	165	Iron	Turtle Flam. Flow.	2011	2011	yes	?	yes	2012-13	to be determined; occupied nest 2011-12
25	166	Vilas	NHAL SF	2011	2011	yes	yes	yes	2012	to be determined; occupied nest 2011-12
26	131	Oneida	NHAL SF	2005	2011	yes	yes	yes		to be determined; occupied nest 2011-12
27		Sawyer	Flambeau R SF	2011	2011	yes	yes	yes		to be determined; occupied nest 2011, inactive 2012
28	145	Florence	Wild Rivers	2011	none	~ 50’	No	yes	2011-12	No suitable habitat remains; territory inactive after clearcut harvest w/50’ buffer
29		Sawyer	Flambeau R SF	2012	2012	yes	yes	yes		To be determines; occupied nest 2012

Site #	ID	County	Ownership	Yr Nest Reported	Yr. Guides Used	Guide 1 - (No-cut Area)	Guide 2 - (Residual BA)	Guide 3 - (Seasonal Disturbances)	Year(s) of Harvest	Outcome
30		Sawyer	Flambeau R SF	2012	?					To be determined; occupied nest 2012
31		Oneida	Oneida Co. For.	2011	2011	~150’	yes	yes	2012-13	To be determined; occupied nest 2012

1- Written management guidelines not available until December, 2005. Department-wide guidance available summer 2012. Color codes: brown = timber harvest most likely directly or indirectly led to nest area abandonment; yellow = unsure about cause of abandonment (possibly from harvesting, predation event at nest, or unknown); green = forest management completed and breeding pair retained.

Although we observed 100% retention of occupied nesting areas with a 10 chain no-cut buffer area, there was evidence that a smaller no-cut area was tolerable to some breeding pairs when used with the other guidelines (e.g., site numbers 16 and 20). The reduction in no-cut area that goshawks will tolerate appears highly variable among adult pairs and should only be used after consulting a biologist experienced with goshawk nesting requirements.

Historic Territory Monitoring and Productivity

We monitored 45 Goshawk territories for activity following a standardized protocol (Woodford et al. 2008). We documented 21 nesting attempts, two nesting areas occupied by territorial adults, and one territory occupied by nesting red-shouldered hawks (*Buteo lineatus*) across 10 counties in northern Wisconsin (Fig. 1). Results from monitoring visits by individual territory are available for DNR staff and partners with NHI data sharing agreements.

Monitored territories produced 24 young at 13 successful nests (Table 2). This yields productivity rates of 1.14 young/nest attempt and 1.85 young/successful attempt. Both productivity rates were below average rates recorded during the past 12 years of monitoring. The mean fledging date for active nests was 20 June. This was the earliest mean fledging date we have ever recorded and was likely caused by the relative early spring and record warm temperatures observed in March in northern Wisconsin.

Table 2. Goshawk Productivity by State and National Forests in 2012 and overall in Northern Wisconsin 2001-12.

Year	Territories Monitored (#)	Nesting Attempts	Successful Nests	Young Fledged	Yng./Nest Attempt	Yng./Succ. Nest	Nest Success (%)	Mean Fledging Date
2012 (State Lands[a])	18	7	6	11	1.57	1.83	86	
2012 (National Forest[b])	19	8	4	8	1.00	2.00	50	
2001[c]	20	7	6	14	2.00	2.33	86	NA
2002	43	12	6	12	1.00	2.00	50	NA
2003	45	15	13	25	1.67	1.92	87	25 June
2004[d]	45	16	10	22	1.57	2.20	71	29 June
2005[e]	40	20	11	23	1.21	2.09	58	30 June
2006	35	21	9	21	1.00	2.33	43	2 July
2007	38	15	7	14	0.93	2.00	47	23 June
2009	29	15	13	28	1.87	2.15	87	27 June
2010	29	17	12	27	1.59	2.25	71	22 June
2011	46	20	16	33	1.65	2.06	80	28 June
2012	45	21	13	24	1.14	1.85	62	20 June
totals	414	179	116	243				
mean	38	16	11	22	1.42	2.11	67	26 June
SD	8.5	4.3	3.3	6.5	0.38	0.16	16.5	

[a] - State properties included the Northern Highland American Legion and Flambeau River Forests.

[b] - Monitored the Chequamegon side of the Chequamegon-Nicolet National Forest

[c]- Monitoring effort less than other years and not included in summary statistics.

[d]- Two nest attempts not included because of missing final count.

[e]- Outcome of one nest attempt not determined, thus it was not included in reproduction measures.

CONCLUSIONS

Based on field evaluations, the Wisconsin DNR's management guidelines for goshawks appear to be successful in protecting and retaining goshawk nesting areas located in or near forest stands undergoing timber harvesting. We strongly recommend the continued use of the guidelines to protect historic and newly reported goshawk nesting areas into the foreseeable future. In addition, all new state property Master Plans should include goshawk management guidelines if the property is located within known goshawk breeding range and has suitable habitat present.

This project should continue into the future. There are 10 nesting areas where guidelines have been used and harvesting will occur in the next couple of years. Complete evaluation of these sites will help determine if the guidelines are effective or possibly could be relaxed. Nest territory monitoring provides the only standardized data on goshawk productivity or abundance in Wisconsin. Annual monitoring should continue until the goshawk's status is deemed safe.

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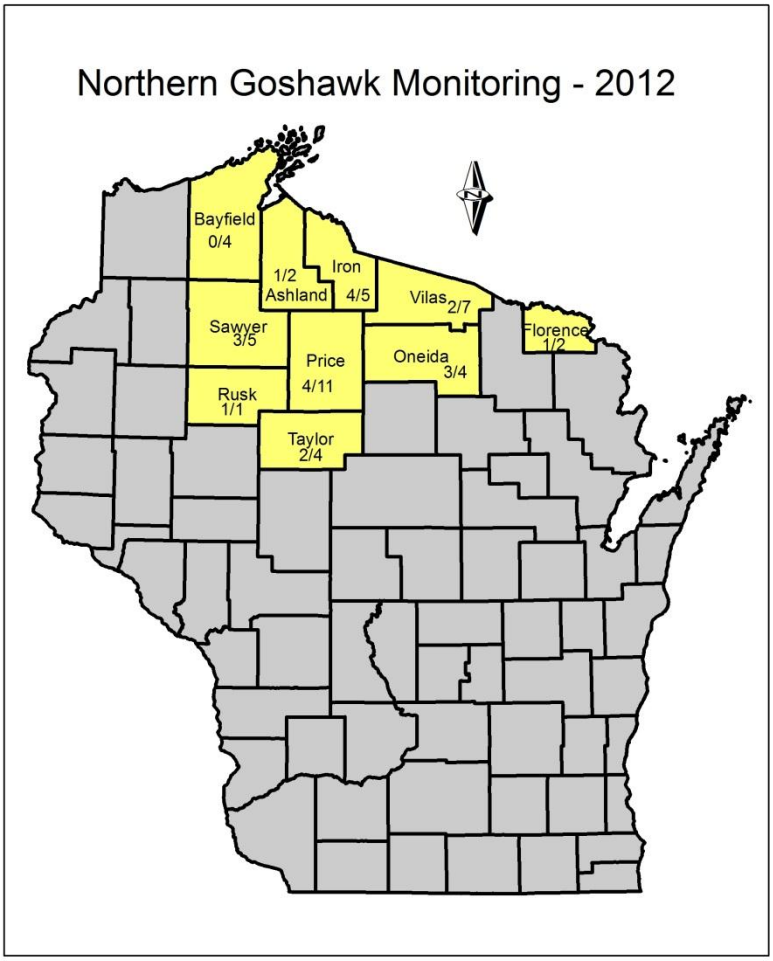

Figure 1. Wisconsin counties where Goshawk monitoring occurred (yellow) in 2012. The numbers listed near each county name are the number of sites with nesting activity followed by the total number of territories checked.